

ABSTRACT OF THE DISCLOSURE

The invention provides apparatus and methods for a Virtual Private Network (VPN) in a network that offers a simple user interface for efficient utilization of network resources. The VPN is defined for a specified set of endpoints each of which is associated with a single "hose." A hose provides access to the VPN through an access point which may be a node of the network, for example. The hose is a single interface to the VPN for communication to all other endpoints of the VPN. The VPN achieves network resource allocation efficiency by exploiting resource sharing possibilities via multiplexing routing paths between endpoints and dynamic resource allocation techniques that permit real time resource allocation resizing. When a VPN is established with a VPN service provider, the routing paths between the endpoints of the VPN is optimized for multiplexing opportunities so that resource allocations between nodes along routing paths within the IP network is reduced to a minimum.